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THE

Chicago Academy of Sciences

THE LICHEN-FLORA

OF

CHICAGO AND VICINITY

BY

WILLIAM WIRT CALKINS

BULLETIN No. I

OF THE

Geological and Natural History Survey

ISSUED APRIL, 1896

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LETTER OF TRANSMITTAL.

CHICAGO, ILLINOIS, April 1st, 1896.

DEAR SIR:

By direction of the Board of Managers of the Geological and Natural History Survey of The Chicago Academy of Sciences, I herewith submit to you the report on The Lichen-Flora of Chicago and Vicinity, prepared by William Wirt Calkins, for publication as Bulletin No. I of the Survey, to be issued under the rules of the Academy governing such matters.

Respectfully,

C. M. HIGGINSON,
Pres't of The Academy of Sciences.

WILLIAM K. HIGLEY,
Chairman.

The Board of Managers of the Geological and Natural History Survey of The Chicago Academy of Sciences:

WILLIAM K. HIGLEY, Chairman.

CHARLES S. RADDIN, Secretary.

GAYTON A. DOUGLASS.

WILLIAM E. LONGLEY.

THOMAS L. JOHNSTON.

THE GEOLOGICAL SURVEY.

The BULLETIN on the Lichen-Flora is the initial number of a series of publications in which the Geological and Natural History Survey of the Chicago Academy of Sciences proposes to discuss the plants, animals and geolôgical formations found in the vicinity of Chicago. In this first issue it may be well to briefly outline the history and state the objects and aims of the survey.

On the 10th day of May, 1892, the Academy of Sciences unanimously adopted the recommendation of its Executive Board that a committee of three be appointed from its active membership to conduct a topographical survey of Chicago and vicinity. At the June meeting of 1892 the Academy adopted the recommendation of this committee to enlarge the scope of the work so as to embrace the natural history of the region; the work to be known as the Geological and Natural History Survey of the Chicago Academy of Sciences. Three general departments were decided upon: Geology and allied sciences, Topography, Zoology and Botany. It was further decided that the work in the several divisions of these departments should be entrusted to men recognized as specialists, and published as bulletins and reports, which should be as nearly monographic as possible.

Since the organization of the survey, the work has been steadily progressing, and a large amount of data has been collected. It is eminently fitting that before studying the rocks and higher forms of vegetable life, the lichens should be taken from the boulders and the bark and made the subject of the first issue.

The survey comprises a labor both of economic and scientific value. The publications on geology and topography are awaited with great interest by contractors, engineers and scientific men generally. The co operation of practical men in the preparation of these reports has been spontaneous and very general. It is proposed to show the character of the rock strata underlying our área, their distance from the surface in different localities, the nature of the materials resting on the rock, the depth necessary to reach water, and such general information as will assist builders, well-borers and engineers in the prosecution of their professions. With this will be reports on the geological formations, their origins, extent and relations to the present condition of affairs in Chicago and vicinity. There are many features of our local fauna and flora

which are either unfamiliar or unknown to the majority of the people. Hence to place reliable reports on these subjects in the hand of older workers and beginners, of educators and students, is not only to increase facilities for information, but to awaken interest and stimulate investigation.

The area covered by the survey is peculiar in two distinct systems of drainage, either of which may, under certain conditions, prevail over the other. This peculiarity of the drainage is of great scientific interest. To bring out this relief it was thought desirable to fix upon the following boundaries: Beginning at the north line of Cook County and Lake Michigan, thence westward, coincident with the north line of Cook County to Kane County; thence southward along the east line of Kane and Kendall Counties to the southeast corner of Kendall County; thence eastward, coincident with the south line of Cook County to the east line of Lake County, Indiana; thence northward to Lake Michigan.

This gives an area of about forty-eight or fifty miles square, which, after deducting the approximate area of the lake-covered portions, leaves nearly eighteen hundred square miles of land surface. It comprises all of Cook and DuPage Counties, the nine north townships of Will County and a portion of Lake County, Indiana. Of the proposed reports now in preparation, a list of which may be found elsewhere, many will be illustrated and some will describe species. All will give such notes and information as will be of scientific interest.

It will be the aim of the Board of Managers of the survey to have specimens in the Academy collection illustrating the local rocks, minerals, fossils, animals and plants enumerated in the reports. This will enable the student to compare and study the objects and not have to depend solely on descriptions.

The first BULLETIN, on the Lichens, is of especial value, because the field is practically new in our vicinity. Few of our local botanists have directed their attention to this class of plants. Mr. Calkins has deposited a complete collection of local lichens in the Herbarium of the Academy building, and it is hoped that the BULLETIN, together with the specimens, will develop interest and investigation in this form of plant life, and lead to the discovery of many new species and localities. It is desired that all who are interested in the advancement of science will co-operate with the Board of Managers by furnishing any data within their reach.

The Lichen-Flora of Chicago and Vicinity.

William Wirt Calkins.

INTRODUCTION.

The following report, based upon my personal investigations, collections and studies, during a period of many years, has been prepared by invitation of the Board of Managers of the Geological and Natural History Survey of The Chicago Academy of Sciences.

As directed by the Board the report covers an area comprising all of Cook and Du Page Counties, nine townships in the northwest part of Will County, and a portion of Lake County, Indiana. This territory might be thought sufficiently large to furnish an attractive field and ample material for the investigation and study of lichens, yet with the exception of the most common species, a few of which are cosmopolitan in their habits, the explorer will meet with a disappointment not to be experienced further south and west in regions where the conditions of the soil, the geological features of the country, and the climate favor a larger development of species. Hence mountainous districts and the extreme South offer the greatest variety of forms, those of Florida being largely semi-tropical and identical with West Indian and Central American species, especially in certain genera, as Graphis and Arthonia. However, in the field under our consideration, enough varieties occur to form an excellent preliminary course of study, fitting the student for larger views and greater results when he has become familiar with the Parmelias and Physcias which are so abundant on oaks and other trees along the lake shore and in the "wooded islands of the prairies."

The geological conditions in most of our territory are not favorable to the growth of a great number of species owing to the absence of forests and out-cropping rocks of different formations and ages, all having an important bearing, because these are the substrates to which lichens attach themselves, and the investigator will note at once that certain strata and trees, or the earth, contain some species not found elsewhere, while others are indifferent as to substrate. Localities in and around Chicago formerly rich in lichenose vegetation are now destitute of it. The species were and are mostly corticolous, with a few on rocks, where exposed, and even on the boulders of our prairies. But the tidal waves of civilization have changed the conditions under which lichens grow, and to find them abundantly we must seek the country where the air on which they feed is pure and the substrates suitable. The sandy soil of the lake shore only produces them where it is covered or mixed with vegetable mould. Northwards from the limits of Chicago the genera Cladonia and Peltigera are found in the woods on earth. The scarce growth of Birch (Betula papyracea), near Glencoe, contains two species rare in this section. These are Sagedia oxyspora, Tuckerm. and Pyrenula thelæna, Tuckerm. The former is peculiar to that substrate. On trees, notably the oaks, are abundant growths of Parmelia borreri, Turner, P. caperata, (L.) Ach., Physcia stellaris, L., Lecanora subfusca, Ach.; and on hickory, Arthonia lecideella. Nyl. The latter is peculiar to this substrate and the genus rare, in our territory, in species, although the above and A. spectabilis, Fl., are abundant. Leaving the vicinity of the lake and the flat-prairies, we find further west and south the best development of lichen-flora along wooded streams and on rocks where these are exposed. Gravel, boulders, old fences, logs and stumps, sustain many species. New and rare ones sometimes reward the explorer. At Riverside I found a new Verrucaria on siliceous deposits and at Joliet, another new species, Lecanora perproxima, Nyl., on silurian rocks. Both have been described by Dr. Nylander, of Paris. The saxicolous species are the most difficult and many are in confusion. The occupation and use of nearly all the lands; the denudation of forests, and drainage of the country, has, as in the case of the phænogamia, caused many species to disappear entirely from our territory. The best localities for saxicolous types are in the township of Lemont and Will County. Hanover and other places adjacent to streams produce common forms. A few occur on earth

and on mosses, which are minute and easily escape detection. On calcareous soils in Lemont, also in Will County, may be found, besides Cladonia, the curious Heppia despreauxii, Tuckerm. and several species of Endocarpon; also a member of the Algæ Nostoc commune, L. The close association of these species, which I have witnessed in other States on similar strata, is worthy of note. From what has been said it appears that it is not safe to fix definitely the number or limits of species in any territory, at this early date of scientific research. The experience of the author, resulting in the addition of nearly thirty new species of lichens to botanical science, is proof of the fact that there are still hundreds of species yet undiscovered.

Some eight years ago Willey estimated that the whole number of North American species might ultimately reach one thousand, but that limit has been passed already, as I have the names of over sixteen hundred, including varieties, and it is not at all probable that, after the most conservative study and elimination, the number would be reduced by more than three hundred, if so many.

Having now reviewed in a general way the lichen-flora of the territory under consideration, it seems proper, as nothing has ever been published in the West and South regarding Lichens, beyond mere lists of species, that something should be said about the life history of these humble plants, and of the study, development and progress of the Science of Lichenology, especially in the United States. The account must necessarily be condensed, but it is believed will be of great utility.

WHAT ARE LICHENS?

This very natural and primary question may be thus answered: Lichens are a natural order of aerial plants which are considered as intermediate between Algæ and Fungi, but the limits are still uncertain. All are Thallophytes destitute of stem, leaf, root, or flower, and vegetate under the influence of moisture, obtaining the elements necessary to their growth from the air, and not from their substrates, as do the Fungi. Consequently lichens are rapid or slow in growth according to the conditions surrounding them. In extreme heat they become torpid, or do not fully develop, frequently appearing on the surface of their substrates as excrescences, wart-

like or coralloid. This condition gave rise to the pseudo-genus Lepraria, Isidium, etc., not now recognized. Lichens may grow for a century or more, and under poor surroundings increase by bisection, like Algæ. They will be found under these conditions near towns and cities, where the air is not pure.

The thallus and the apothecium, or fruit, are the parts of the plant to first attract attention in the higher lichens—for example, the Parmelias, so common on our oaks. The thallus is attached to its substrate by fibrils, or is subcortical, but is absent in certain species, as the parasitic ones.

In the thallus are green cells called gonidia, and other organs, as spermogonia and pycnidia. Dr. T. M. Fries constructed a system based on the gonidia, which are variously formed and colored. The thallus supports the apothecium, which is the most important part of the plant. This appears on the surface, disk-like, lirellate, etc., and of several colors, such as red, orange, black or brown. In some genera the fruit appears as minute, wart-like bodies, with only a pore (ostiole) at the summit. In others, as Cladonia, the fruit is at the end of thalline stalks (podetia), or as in Cetraria, on the edges of the thallus. There are, however, various modifications of all these. One peculiarity of some lichens is the power they have to burrow into the hardest rocks, even flint and granite, thus making for themselves homes (foveoli). The power is furnished by the carbonic acid absorbed from the air. As an example, Verrucaria ruderella, Nyl., from the limestones of La Salle county, Ill., may be mentioned. The apothecium contains the germinating cells, or spores, which are inclosed in sacks, called thekes. There are many organs, all of which must be examined under the microscope, and these have been the subject of profound study and discussion many years, but especially since the microscope came into use. On them many fanciful theories as to the origin of lichens, whether they are autonomous or not, have been built. Fries called them aerial algæ. Schwendener gives his views as follows, which seems marvelous, if true: "All these plants are not individuals in the common sense of the term; they are rather colonies, consisting of hundreds of thousands of individuals, of which one holds the mastership, while the others, in eternal captivity, prepare the nourishment for themselves and their master. The master is a Fungus of the class of Ascomycetæ, a parasite which lives on the labor of

others. It encloses them as a spider its prey, with a network of delicate tissue, which is gradually transformed into an impervious integument. But while the spider sucks the life out of its prey, the Fungus stimulates the algæ in its grasp to greater activity, to a more vigorous increase, and thereby renders possible a more luxurious growth, and promotes the welfare of the whole colony." *

However grand the Schwendener theory, the question of autonomy is still open, while new discoveries are being made which may eventually change the whole aspect of the science. Our best way now is to effect their classification under the present system as elucidated by Tuckerman, but not ignoring others entirely.

The student seeking to become acquainted with lichens will soon learn to distinguish those highest in the scale, as Parmelia and Physcia, in our vicinity, by the prominent, foliaceous thallus, and apothecium, and having fixed the external character in his mind, will soon associate with them others of similar appearance, yet differing to some extent in thallus and fruit. In the same manner he will identify and bring together species of other genera, and perhaps stumbling on forms of Lecanora and Pyrenula, lower in the scale, observe the characters that seem prominent and common to all. Experience will enable him to determine very many of our common species from external characters alone, as indeed, the early lichenologists determined them all, even up to the time of Webber and Acharius.

THE DIVISIONS OF LICHENS.

All our lichens may be placed in one of the two series into which they are divided by the fruit. First, the Gymnocarpi, those with open fruit; second, the Angiocarpi, those with closed fruit Pyrenocarpous). There are five tribes, Parmeliacei, Lecideacei, Graphidacei, Caliciacei, Verrucariacei. Only the last belongs to the second series. The tribes are based on the apothecia; families on the thallus and fruit. Genera and species follow. Other subdivisions are made for convenience, and sometimes at the caprice of authors.

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* *Die Algentypu Flechtengonidien.*

THE THALLUS AND APOTHECIUM—SOME OF THEIR ORGANS.

The thallus, when present, and the apothecium, are to be considered and studied externally, but the organs of the plant must be examined with the microscope. Some of these have been mentioned, and I can only refer briefly to others, doing so in order to guide the first steps of the explorer, who, at every advance, will meet with new problems and find all aids necessary. In examination, the membraneous thallus, cut in a thin section, will show above what is known as the cortical layer of minute aggregated cellules; next, the gonidial layer of green cells; then will follow compacted filaments (hyphæ), and in this formation rest the gonidia. Below is the inferior cortical layer, from which, in many species, proceed fibrils (hypothallus), attaching the plant to its substrate. Some lichens, such as the parasitic, and some others, Peltigera and Collema, have no thallus; either the upper or lower cortical layer may be absent, or but one scantily represented. The gonidial and other wart-like eruptions sometimes appearing on the crust (soredia), constituted the basis of the old pseudo-genera. The color of the thallus above and below may differ, as in Sticta. The gonidia of divers forms and colors are variously placed, singly or grouped, or of confervæ-like character.*

The apothecium, which has been slightly noticed, whatever its shape, has a uniformity of internal structure. The disk-epithecium, (exciple), contains the other organs, and is enclosed by a margin, which may be formed from the thallus (thalline margin). It is then known as lecanorine. When the margin or border is not thalline the apothecium is lecideine. Then there is the nucleiform apothecium of angiocarpous lichens. The exciple, when colored or blackened, is biatorine; when composite, zeorine. Grouped apothecia form a stroma. The perithecium and amphithecium of the angiocarpous lichens are the outer and inner coverings; within is the nucleus. A section of the apothecium viewed under the lens, shows the epithecium to be of colored, granular matter and borne on the apices of what are termed the paraphyses—slender filaments growing from the medullary layer. The apices are globular or clavate. The thalline exciple containing gonidia, and the hymenium, bearing the thekes, within which are the spores, will be seen. The hymenium is either colored or

* Th. M. Fries, Dr. Minks and others as to their systematic value.

colorless. The thekes vary in shape, linear, clavate, etc., and are large or small, according to the spores. The latter are variable in form, size and color, as well as in number; they are either simple or divided by transverse septa into cells, usually eight, when they are called eight-locular; if more, pluri or multi localar, but there may be less. When it is also divided longitudinally it is called a muriform spore. The examiner will often find no spores, hence should have fresh plants, particularly of Arthonia. The spore may be less than a thousandth of a millimetre in diameter, but some can be seen with an ordinary lens. Much importance is attached to the colors and shape of the spores. Spermagones have been mentioned. These will exhibit, arising from them, small filaments, which if simple are called sterigmata; if articulate, arthrosterigmata, to which are attached minute bodies (spermatia) which are various in form. Nylander, Minks and others have theorized and written learnedly in regard to their functions.

It would be desirable to explain further in regard to the spores and other organs entering into lichens, but these can be studied to better advantage after one has acquired some knowledge of the more obvious characters, besides no one can do much with any satisfaction until he has studied our greatest American authority, Tuckerman, and with his works those of the great Lichenologists of Europe, a few of whom are mentioned hereafter. Armed with these, a genuine love and adaptability, success is assured up to a limit, for it is not probable that all the secret processes of nature can be wrested from her grasp by even the greatest minds in a single lifetime.

THE DEVELOPMENT AND PROGRESS OF THE SCIENCE OF LICHENOLOGY.

The study of lichens was for many years, on account of its supposed difficulties, confined in this country to a very few persons, who lived remote from each other. Thus it has a scattered and little known literature, which, however meager in quantity and quality (with the exception of the works of Tuckerman and Willey), has proved almost inaccessible to students, or those who otherwise would have become interested in a branch of botany now assuming more importance among American students. There were, also, other reasons why so few botanists pursued the study. Until the late Professor Edward Tuckerman published his great works upon American Lichens, the results of a life-time of devoted labor,

there was not in the United States any lichenological literature worthy of the name; no system of classification of American origin, under which our vast and rich lichen-flora could be arranged. Students were dependent entirely upon the works of Euporean authors, and these were mostly in foreign languages not easily to be obtained or understood here, except by the very few, who, like Tuckerman, lived under the shadow of a great university and had a liberal education. Thus it was that New England almost wholly absorbed the study of this branch of science. Also, every European lichenologist had a system of his own, and no two could agree on a uniform method of classification applicable to the species known and the many new forms being constantly discovered.

In ancient times nothing was known of lichens as a distinct order of plants, but one or two species have been found in coffins, no doubt used for padding. A reference to the old herbalists of the twelfth and fifteenth centuries show that lichens then went under the names of "fuscus" or "muscus," and were considered allied to the mosses. They began to attract more attention in the sixteenth century, and over twenty species were described. The general revival of all learning after the dark, middle ages, stimulated the study of botany, and lichens shared in the benefit. It was then that Tournefort separated them from the musci, and included all then known under the general name, Lichens. This distinctive term was accepted and used by the great Linnaeus. From sixteen hundred to the Acharian period, about 1802, rapid progress was made in the study. During this period lived Micheli, Webber, Dillenius, of Oxford, Hoffman, Linnæus and Acharius, the "Father of Lichenology." All these were celebrated for their learning and published works upon lichens. Over three hundred species became known up to 1750, and were arranged in natural groups and genera, many of which still stand. Their chemistry and economic uses were studied, and collections of lichens made. But the best thoughts of investigators in the latter part of the eighteenth and the first years of the nineteenth century found a truer expression at last in 1803, when Acharius published the result of his studies in the Methodus Lichenum, followed in 1810 by his Lichenographia Universalis, and in 1814 by the Synopsis Lichenum. These gave full accounts of all the then known species, over nine hundred. A number of American species are mentioned.

He made no use of the spores and thekes in his classification. The system he founded was long used and made his name immortal. In 1831, Elias Fries, the great Swedish botanist, published the Lichenographia Europea Reformata, and gave utterance to views that have influenced all later studies of the greatest students of lichens. He divided them into eight tribes, of which five now stand as given elsewhere. He also made further divisions which subsequent writers changed or assumed. The views of Fries were so far in advance of others and his work as a systematist so highly regarded, that Tuckerman referring to the advances made in the study of lichens, says: "The whole movement took its start from the results gained by the unsurpassed penetration of Elias Fries."

But the period was a golden one and prolific of eminent botanists—Nylander, Eschweiler, Fee, Wallroth, Schaerer, Montagne and Floerke, all systematists. There were also many others of great eminence in Lichenology. Of the above Dr. William Nylander, who still survives, is the most celebrated. He has not only published many philosophic papers and works, but has described more new species than any other man, and his knowledge of lichens exceeds that of all others. Dr. J. Muller is hardly less distinguished, however, while Dr. Minks, and Schwendener, have achieved renown by wonderful discoveries as to the anatomy and growth of lichens, which, if they are confirmed, will overturn all previous theories. From what has been stated it will be seen that Europe had monopolized the field of study, and naturally enough, for America was young.

It was at such a time that Tuckerman, who had turned early to the investigation of lichens, became an earnest student of the great European botanists, particularly of Acharius, Fries and Nylander. Assisted in the field by several enthusiastic workers, portions of New England were explored and the lichen-flora studied and made known to the world. As his views enlarged he gradually came to have conclusions of his own as to the systematic arrangement of the species in harmonious and natural relations with each other. The great Swede seems to have been his guide in part, while Nylander was not disregarded, nor in later years the new discoveries of Minks, Tulasne, Bayerhoffer and others. Tuckerman was pre-eminent as a systematist, and the full elucidation of his views will be found in his works—The Lichens of California, 1866; General Lichenum, 1872; and his Synopsis,

Part I., 1882. A close study of these will show how very near he came to nature in his reading of her laws as applied to the lichens, and how well he succeeded when he came to their arrangement. The key to his success may be found in his expression—"Apprehension of the Habit of Lichens." This was certainly an inspired faculty and led him to forecast the relations of lichens by which they could be placed in the system he established, as Tribes, Families, Groups, Genera, Species, etc. The one great American Lichenologist is dead, but the services performed cannot be overestimated. Part II. of his Synopsis, left incomplete at his death, which occurred March 15, 1886, was edited and published by Henry Willey, Tuckerman's life-long collaborator, in 1888. The foregoing were by no means all of Tuckerman's works, but they are the most important, on which rests the solid basis of his fame. As a supplement to the labors of Tuckerman, American Lichenology has been benefitted by Henry Willey, in his publication, "Synopsis of the Genus Arthonia," and his introduction to the "Study of Lichens," but these must be considered rather as aids to be used in connection with the study of other authors. While the publications mentioned are the chief ones in this country, monographs upon a single genus, or species, have appeared from time to time; also local lists and brief papers, and these evince the interest awakened, which no doubt received its impelling force from a knowledge of the genius and labors of Tuckerman.

THE ECONOMIC USES OF LICHENS.

A few remarks on this subject will show how large a part these seemingly humble plants play in the economy of life. The Reindeer Moss (Cladonia rangiferina) furnishes not only food for the reindeer in the Arctic regions, but alcohol and brandy are distilled from it by the natives of Norway, Sweden and other countries. The Iceland Moss (Cetraria Islandica) has long been in use, both for food and medicine. Cetraria nivalis is also eaten. In Africa Lecanora esculenta is so abundant on sandy plains that it is gathered for food for man and beast. Many Arctic voyagers have prolonged and saved their lives by the use of species of Umbilicaria—rock-lichens (*Tripe de roche*). In Japan a species of the genus Endocarpon,, also common in Illinois, is used as food. Valuable dyes were formerly obtained from several lichens, such as Roccella tinctoria, Lecanora tartaraea, Parmelias, etc. The new

discoveries in chemistry did away with their use in civilized nations. Lichens were once valued highly as remedies for various diseases, and some species are still used, as Peltigera canina. Theloschistes parietinus, Cladonia aphthosa, and numerous other forms of various genera, all common to our own country and easy of investigation by students.

LICHENS OF THE TERRITORY INCLUDED IN THE SURVEY.

The species enumerated are represented in the "Exsiccati of North American Lichens," deposited in the collection of the Chicago Academy of Sciences by the author. The descriptions of species are made from studies of the specimens, comparisons, and study of other authors.

SERIES 1. GYMNOCARPI.

TRIBE 1. PARMELIACEI.

FAMILY 1. USNEEI.

Ramalina, (Ach.) De Not. Thallus fruticulose, or pendulous, subcompressed, pale-greenish; apothecia scattered, or marginal, scutella-form. Spores colorless, bilocular.

1. **R. calicaris,** (L.) Fr. Thallus tufted, rather rigid; longitudinally lacunose; apothecia flattish. Spores ellipsoid.
   On oaks near Riverside; at Lemont on stony bluff, and in Will County.

2. **R. calicaris,** Fr., var. **fraxinea,** Fr. Thallus wide and long-lobed; apothecia lateral.
   On oaks and old fences near Lemont.

3. **R. calicaris,** Fr., var. **fastigiata,** Fr. Lobes short, often straw-colored, crowded, branched; apothecia terminal, subfastigiate.
   Along lake shore and throughout our territory, on oaks.

Cetraria, (Ach.) Fr., Mull. Thallus ascendant with compressed, turgid, or channelled branches; or may be expanded and foliaceous-membranaceous; brown, yellowish, or glaucescent; apothecia marginal or submarginal, scutella-form, often dilate. Spores sub ellipsoid.

4. **C. ciliaris,** (Ach.) Thallus membranaceous, foliaceous, sinuate-laciniate; greenish or brownish; brownish beneath, fibrillose; lobes crowded, often narrowed and cleft, lacunose; apothecia marginal, ample; disk chestnut, margin crenulate. Spores subellipsoid. Ach. L. U., p 508. Platisma, Nyl. 5, Syn. 308.
   On old rails in Lemont Township; on old birch at Glencoe.

5. **C. aleurites,** (Ach.) Th. Fr. Thallus membranaceous, foliaceous, divided or cleft, isidiod, plicate at centre; beneath pale, wrinkled, fibrillose; lobes sinuate-laciniate, with crenate tips; apothecia marginal, granulate on the margin, brown, medium size. Spores round.
   On old rails near Lemont and Joliet.

FAMILY 2. PARMELIEI.

Theloschistes, Norm. (Physcia, Nyl.) Thallus foliaceous or reduced, appressed or ascendant; membranaceous, orange or yellowish, apothecia scutellæform; disk yellow, orange or greenish-yellow. Spores ellipsoid, polar-bilocular or simple.

6. **T. chrysophthalmus,** (L.) Norm. Thallus tufted, more or less erect, spreading; the branches narrow, linear, smooth or puberulent; tips mostly fibrillose and ramulose; apothecia few; disk orange, which is often fibrillose. Spores ellipsoid. Parmelia chrysophthalma, Ach. M. L. 267.

In Hanover Township, Cook County, and Will County; at Lemont, on old rails in woods. Also on old oak trees near the lake shore, Lake View.

7. **T. parietinus,** (L.) Norm. Thallus, foliaceous, sub-orbicular, crenate, yellow and orange, lobes appressed, sub-imbricate, radiant, rounded: apothecia small to ample, orange, border entire or flexuous. Spores ellipsoid. Parmelia, Fr., L. E. 72; Xanthoria, Th. Fr. L. Scand., 145.

Along the lake shore, on oaks and poplars; also in Lemont and elsewhere.

8. **T. lychneus,** (Nyl.) Thallus reduced, substellate, or effuse, yellow; apothecia scattered; yellow-orange, entire or granulate. Spores ellipsoid.

On walnut and hickories, west part of Cook County and elsewhere. It has a numerous synonomy, and is often considered a variety of No. 7.

9. **T. concolar,** (Dickson) Tuckerm. Thallus foliaceous, orbicular, greenish-yellow; divisions narrow, much dissected; beneath pale, fibrillose; apothecia small, yellow or rufous. Spores numerous. Physcia candelaria, Nyl., etc.

On various trees along the lake shore at Glencoe. All the genus may be distinguished by the golden or yellow thallus. May be mistaken for Placodium.

Parmelia, (Ach.) De Not. Thallus imbricate—foliaceous, lobate or laciniate, appressed, membranaceous; more or less fibrillose, sometimes densely so; apothecia scutellæform, slightly pedicellate. Spores ellipsoid. *Vide* Schwendener.

10. **P. perlata,** (L.) Ach. Thallus greenish-glaucescent, or whitish; dilated; lobes rounded, often sorediate, undulate; black beneath, with brown margins; apothecia small to large, rufous, entire. Ach. L. U. 459, etc.

Found throughout our territory on oaks and other trees, and on boulders near Lemont.

11. **P. perforata,** (Jacq.) Ach. Thallus whitish, much dilated; coriaceous, membranaceous, glaucescent, smooth, sinuate lobed; beneath black or fuscous; fibrillose; apothecia very large, perforate, cyathiform; disk fuscuous or rufous. Spores ellipsoid. Ach. L. U. 459, etc.

On various trees in Cook and Will Counties. A common species.

12. **P. crinita,** Ach. Thallus dilated, membranaceous, surface covered with minute granules and branchlets; black beneath and fibrillose; lobes ciliate; apothecia ample, cyathiform; disk chestnut. Fr., L. E., 58.

On oaks in Hanover Township; on detached rock near Lemont; not common.

13. **P. cetrata,** Ach. Thallus greenish, dilated, rather thin, smooth; beneath black and hispid: the sinuate lobes sorediferous on the margins, narrowed, soon prolonged: apothecia medium size, chestnut. Ach. Syn. L , 198, etc.

On trees and stones near Lemont and westward.

14. **P. tiliacea,** (Hoffm) Fl. Thallus smooth, closely adnate, much narrowed, membranaceous, margins crenate; lobes rounded, sinuate-laciniate; apothecia medium size, few, margins crenulate. Fr. L. E. 59, etc.

On oaks at Riverside, Lemont and Hanover. There are varieties in the South.

15. **P. tiliacea,** Fl., var. **sulphurosa,** Tuck. Medullary layer sulphur-yellow; otherwise like the species. Tuckerm, Syn. 1, 57.

Found near Elgin on oak trees. Will probably be found elsewhere.

16. **P. borreri,** Turner. Thallus cinereous, glaucescent; lobes large or narrow, rugulose; beset with round soredia; membranaceous; pale brown beneath, fibrillose, dense; apothecia large, badio-rufous, margin entire. Spores rounded. Turner. Linn. Tr. 148. Ach. L. U. 461, etc.

Very common everywhere in our territory, especially on oaks.

17. **P. borreri,** Turn., var. **rudecta,** Tuckerm. Thallus isidioid. Ach. Syn. 197. Tuckerm. Syn. 58.

Occurs on oaks in the west part of Cook County, and at Lemont and Joliet.

18. **P. saxatilis,** (L.) Fr. Thallus glaucous-cinerascent, membranaceous, more or less lacunose, ramose; isidiophorous; beneath black and densely fibrillose; lobes sinuate multifid, incised; apothecia large, disk fuscous, or spadiceous, margin subcrenulate. Spores ellipsoid. Fr. L. E. 61. Nyl. Syn. 388.

Found on trees in Cook County near Elgin and on recent sandstones and boulders at Lemont.

19. **P. saxatilis,** Fr., var. **sulcata,** Nyl. On bluff boulders and stones near Lemont, and in Will County. Very fine specimens may be gathered in LaSalle County.

The very numerous soredia, which are round or oblong, confluent and reticulate, mark the variety. Tuck. Syn. 58.

20. **P. physodes,** (L.) Ach. Thallus loosely attached, substellate, whitish, coriaceous, glaucous; beneath fuscous-black, no fibrils; lobes many cleft, complicate, often with white soredia; apothecia medium to large, badio-rufescent, margin nearly entire. Spores subellipsoid. Ach. S. L. 218. Tuckerm. Syn. 59, etc.

Occurs on oaks in Cook and Du Page Counties, and elsewhere.

There are several varieties in other States.

21. **P. caperata,** (L.) Ach. Thallus substramineous, dilated, coriaceous, undulate-plicate, often sorediate; beneath black, fibrillose; lobes sinuately-laciniate, rounded tips; apothecia large, chestnut, margin subcrenulate, often sorediate. Ach. S. L. 196, etc.

Very common on oaks everywhere. The fruit is seldom seen here, but the lichen is conspicuous for size and color.

22. P. conspersa, (Ehrh.) Ach. Thallus straw-colored, greenish, laciniate, much divided, appressed, often isidiophorous in the centre; beneath fuscous-black, sparingly nigro-fibrillose; lobes sinuate, often crenate, or pinnatifid, complicate; apothecia large, chestnut, margin subcrenulate. Spores ellipsoid, simple. Ach. L. U. 486. Muhl. Catal. 1818 Tuckerm. Syn. 64, etc.

In Lemont and Will County on stones; also found near Elgin on old wood. This species has a wide distribution in the United States.

23. P. colopodes, (Ach.) Nyl. Thallus coriaceous, glaucescent, beneath dark brown, spongy nap, with a few fibrils; lobes sinuate-cleft, flat; apothecia large, disk chestnut. Spores numerous. Tuck. Syn. 61; Nyl. Syn., etc.

On oaks near Lemont. There is a very narrow lobed form not as yet observed here.

Physcia, (D. C., Fr.) Th. Fr. Thallus foliaceous, variously divided, stellate, somewhat fibrillose; apothecia scutellæform. Spores ellipsoid, bilocular.

24 P. speciosa, (Wulf.) Nyl. Thallus greenish, glaucous, loosely stellate, appressed, beneath corticate, rhizinæ whitish; lobes sinuate, flat, pinnatifid, with powdery margins; apothecia medium size, sessile, margin crenulate; disk fuscous. Spores bilocular Parmelia speciosa, Ach. L. U. 480; Fr. L. E. 80; Tuck. exs. n. 81; Calkins exs.

Occurs at Riverside on oaks; on hickories, near Elgin and other localities.

25. P. stellaris, (L.) Nyl. Thallus albo-glaucescent, stellate, appressed, orbicular; beneath pale, fibrillose, lobes linear, many-cleft, compaginate, or discrete; apothecia small, sessile; disk fuscous-black, often grey-pruinose, margin entire or crenulate. Parmelia, Fr. L. E. 82.

This, the most common species of the genus, occurs everywhere on oaks, hickories and other trees, as well as on rocks.

26. P. stellaris, (L.) Nyl., var. aipolia, Nyl. Thallus brown becoming blackish, beneath black, fibrils hispid; apothecia subcrenate, Nyl. Scand., 111. Parmelia, Ach. S. L. 215.

Found on boulders of the prairies and on stones at Lemont.

27. P. **tribacia**, (Ach.) Tuckerm. Thallus smallish, membranaceous, sub-stellate, glaucescent; beneath white, fibrillose; lobes short, appressed; margins erose, granulate; apothecia small, sessile, black or pruinose, margin sub-entire. Lecanora, Ach. S. L. 191. Tuck., etc.

On elms at Glencoe, and in other localities on hickory. A variety of P. stellaris, (d.) of Tuck. Syn., 75.

28. P. **obscura**, (Ehrh.) Nyl. Thallus stellate, orbicular, appressed, epruinose, glaucous, fuscescent, beneath black, fibrillose, lobes many-cleft, flatish; ciliate; apothecia rather small; disk nigro-fuscous, margin entire. Spores bilocular. Th. Fr., Scand. 142. Harmelia, Fr. L. E. 84.

On hickories and other trees in west part of Cook County; near Lemont and Joliet on trees and calcareous rocks. Quite variable everywhere, having several forms.

29. P. **adglutinata**, (L.) Nyl. Thallus often slightly olivaceous, also cinerascent and brown, adheres closely to substrate, small; lobes thin, flat, compaginate; apothecia small, disk nigro-fuscous, margin entire. Nyl. Syn. 438, etc.

On elms and hickories in Cook and Will Counties. This is a well marked species.

30. P. **granulifera**, (Ach.) Tuckerm. Thallus glaucescent and white, pruinose, be-sprinkled with powdery granules; beneath pale, corticate, fibrils black; lobes multifid, dentate-crenate; apothecia small, inflexed margin crenate. Parmelia, Ach. Syn. L. 212. Tuckerm. Obs. 390.

Found on hickories near Elgin and at Lemont. A variety of P. speciosa (e. of Tuck.), but quite marked.

FAMILY 3. PELTIGEREI.

Peltigera, (Willd., Hoffm.) Fee. Thallus membranaceous, lobate, frondose, foliaceous; beneath somewhat villous, marked with veins, occasionally cyphels; apothecia peltæform. Spores fusiform. Cortical layer, in some species consisting of gonidia, in others, of gonimia.

31. **P. rufescens,** (Neck.) Hoffm. Thallus large, coriaceous, rotund, lobate, lobes elevated and crisp, ash colored to reddish-brown; beneath reticulated with brown veins, fibrillose; apothecia on lobules, large; disk revolute, rufo fuscous. Spores acicular. Fr. L. E. 46. Tuck. exs. n. 104. Calkins. exs.

Occurs at Glencoe in ravines and on hillsides, on earth and old mossy logs. Found also at River Forest near the Desplaines River and throughout our territory.* Tuckerman says this species stands in embarrassing relations to P. canina.

FAMILY 4. PANNARIEI.

Heppia, Naeg. Thallus squamose-foliaceous, monophyllous, Gonimous layer of gonimia; apothecia round, immersed. Spores ovoid.

32. **H. despreauxii,** (Mont.) Tuckerm. Thallus small, round, smooth, or regulose, green; apothecia separate, or in rosettes, sunken in thallus, disk reddish or salmon-colored.

Found on calcareous earth near Lemont. This curious lichen being very small is not easily seen. It seems always to be associated with Endocarpon hepaticum in habitat, and has often been mistaken for a fungus.

Pannaria, Delis. Thallus squamulose, subfoliaceous or monophyllous, the hypothallus spongy or obsolete; apothecia scutella-form, with both thalline and proper margins, frequently biatorine. Gonimous layer of both gonidia and gonimia.

33. **P. nigra,** (Huds.) Nyl. Thallus squamulose, minute, lead colored, and mostly merged into a granuloid crust; apothecia small, biatorine, sessile; disk black, margin entire.

On calcarieous rocks near Lemont and in Will County.

FAMILY 5. COLLEMEI.

Collema, (Hoffm.) Fr. Thallus greenish, cortical layer obsolete; gonimia in chains; apothecia very small to middle size; scutellæform. Spores variously shaped.

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*Other species of this genius are likely to occur.

34. C. **pycnocarpum,** Nyl. Thallus small, pale, green, sub-orbicular, lobes radiate, narrowed, fenestrate, ribbed, the marginal lobules densely fruited; apothecia small; disk reddish, excluding margin. Spores ovoid ellipsoid, bilocular, decolorate. Nyl. Syn., 115.

Found on elms and shrubs in Will County; rare.

35. C. **microphyllum,** Ach. Thallus small, fuscous-green, or olivaceous, orbicular, diffract or effuse, microphylline; lobes often granulate, crenate at centre; apothecia abundant, small, urceolate, rufescent, flat; thalline margin entire, concolorous. Spores sub-muriform. Ach. Syn. L., 310.

On elm bark; Cook and Will Counties; rare.

36. C. **flaccidum,** Ach. Thallus dark-green, or olive-green; lobes large, expanded, bullate, entire, with concolorous granules, undulate plicate, paler beneath; apothecia small, sessile; disk rufescent; margin entire. Spores ovoid. Ach. Syn. L., 322; Tuck. Gen., 91.

Occurs near Elgin and Joliet on oaks and elms; rare. May be found on rocks also.

37. C. **tenax,** (Sw.) Ach. Thallus thin, lobes wide, appressed, also ascendant, lead colored; apothecia often immersed; disk rufescent, the margin entire or rogose. Var. c. of C. **pulposum,** Tuck., exs. n., 148. Calkins, exs.

Found near Joliet on calcareous soil; rare.

38. C. **limosum,** Ach. Thallus thin, dark green, scattered, slightly crenate, pulpy when wet; apothecia rufous, immersed but becoming superficial, margin prominent, entire or somewhat crenulate. Spores in fours in the thekes. Nyl. Syn., 110.

Inhabits clay soil. Will County; rare.

39. C. **granosum,** (Wulf.) Schaerer. Thallus small, rigid, gelatinous when wet; lead colored; lobes ample, rounded or elonggated and divided; apothecia of medium size, sessile; disk reddish, dark. C. dermatinum, Ach. L. U., 64 .

On mossy rocks near Desplains River, Will County.

Leptogium, (Fr.) Nyl. Thallus foliaceous, or fruticulose, cortical layer distinct; gonimia in chains; apothecia sub-scutellæform, lecanorine or sub-biatorine. Spores of various forms.

40. **L. lacerum,** (Sw.) Nyl. Thallus plumbeo-fuscescent, lacero-laciniate, ample, wrinkled, the lobes dilated above and sinuate, thin, crisped and dentate; apothecia small, pale-red, sub-sessile, margin entire. Spores ovoid-ellipsoid. Ach. L. U. 657.

On elms in Hanover Township, near Elgin; also in Will County.

41. **L. chloromelum,** (Sw.) Nyl, Thallus small to large; orbiculate, rigid; plumbeo-virescent, lobate, plicate, rugose; apothecia medium size, lecanorine, plane, rufous, the thalline margin granulate. Spores ovoid. Nyl. Syn. 128. Tuck. Gen. 98.

On elms in Hanover Township, near Elgin; also in Will County. The varieties are found further south.

42. **L. myochroum,** (Ehrh. Schaerer) Tuckerm. Thallus ample, coriaceous, membranaceous, sub-monophyllous, also loosely attached, lead colored and blackish; beneath has a whitish nap; apothecia reddish, border plicate. Spores ellipsoid. Tuck. 99.

On the same substrate as the preceding species, Will County.

43 **L. pulchellum,** (Ach.) Nyl. Thallus small to large, rosulate, glaucous-green, lobes plicate, papulose, wrinkled above and beneath and pitted; apothecia medium size, lecanorine, sub-pedicellate, disk fusco-rufous, finally excluding the smooth or finally rugose thalline margin. Spores ovoid-ellipsoid, sub-muriform, decolorate. Collema, Ach. Syn. L. 321. Tuck. Syn. 161. Calkins, exs.

Found on calcareous rocks in Will County, and on elms in Cook County. Better developed further south in this State.

FAMILY 6. LECANOREI.

Placodium, (D C.) Naeg. & Hepp. Thallus crustaceous, lobed, suffruticulose, or uniform; apothecia sub-scutellæform, lecanorine or sub-biatorine; disk usually yellow or orange. Spores ellipsoid, polar-bilocular, colorless.

44 **P. cinnabarinum,** (Ach.) Anzi. Thallus rimose-areolate, more often of applanate scales, crenate, and crowded into an imbricate crust, orange; apothecia minute or small, adnate; disk orange, margin entire. Spores ellipsoid. Lecanora, Ach, L. U. 402. Parmelia, Fr. L. E. 165.

Very common on calcareous and arenaceous rocks in our territory.

45. **P. microphyllum**, Tuckerm. Thallus squamulose; from greenish-yellow to orange; scales adnate, crowded and concealed by granules; apothecia small, adnate, flat, orange; proper margin entire, the thalline one crenulate. Spores ellipsoid. Tuck. Syn. 174.

Found near Lemont, on old fence panels, and in Will County.

36. **P. aurantiacum**, (Light.) Naeg. & Hepp. Thallus uneven and chinky, warted, broken; yellow or variously colored, often bordered by a dark hypothallus; apothecia fair size, sessile, zeorine, flat; disk lemon, saffron or tawny colored; proper margin thin, the thalline one crenulate or may be obsolete. Parmelia, Fr. L. E. 165. Lecanora, Nyl. Scand. 142. Tuck. Syn. 174. Calkins, exs.

On elms and poplars at Glencoe; on hickories and other trees along the Desplaines river; on rocks at Lemont, and elsewhere. Thallus and apothecia lemon color, in our specimens; abundant.

47. **P. ferrugineum**, (Hudson) Hepp. Thallus chinky, verruculose, ash-colored, upon a black hypothallus; apothecia fair size, mostly biatorine, sessile, flattish; disk opaque, rust-colored, or fulvous, bordered by a crisp proper margin, often enclosed in a thalline one. Parmelia, Fr L. E. 170. Caloplaca, Th. Fr. Scand. 182. Tuck. Syn. 177.

On oaks along the Desplaines river and near Elgin on hickories. Not so common as the preceding species, but plentiful.

48. **P. vitellinum**, Ehrh. Thallus effuse, tartareous, squamaceous, of crenate granules, crowded into heap-like areoles, often dispersed, greenish-yellow; apothecia small, sessile, flat, yellow; thalline margin granulate-crenate. Spores numerous, simple and biloculur. Fr. L. E. 162. Nyl. Scand. 141. Tuck. Syn. 180.

Found on dead wood and rails in Lemont Township. Not common for lack of proper conditions.

Lecanora, (Ach.) Tuckerm. Thallus crustaceous; mostly uniform; apothecia scutellæform, or zeorine. Spores ellipsoid, or oblong.

49. L. pallida, (Schreb.) Schaerer. Thallus thin, membranaceous, smooth, cream colored or darker; apothecia sessile, tumid; whitish-buff, white-pruinose, the entire margin disappearing. Spores ellipsoid. Parmelia, Schaer. Spicil. 396. Tuck. Syn., 185.

On oaks and hickories near Joliet. This species and its varieties are more abundant in some localities than in ours. Varies greatly as to the apothecia.

50. L. subfusca, (L.) Ach. Thallus whitish or cinerascent, smooth, rimulose, granulate, verrucose, soon diffract; apothecia plano-convex, disk fuscous, becoming black, often pruinose, the thalline margin entire, flexuous or crenate. Spores ellipsoid. Parmelia, Schaer. Spicil. 389, etc.

Very common in our territory on oaks and other trees and also on arenaceous rocks. There are several varieties. I have specimens from Europe, Japan and the West Indies. Many species, so called, have been made from this cosmopolite.

51. L. subfusca, (L.) Ach., var. allophana, Ach. Thallus granulate, verrucose; apothecia fuscous-black, margin flexuous and crenate. Lich. Uni. Nyl. 395.

On oaks in various localities; not uncommon.

52. L. subfusca, (L.) Ach., var. argentata, Ach. Apothecia smaller, margin entire. Spores smaller. Lich. Univ. Nyl. Syn 393.

Occasionally found on shrubs and trees in our territory.

53. L. subfusca, (L.) Ach., var. distans, Ach.

Common on the same substrates as the preceding forms; apothecia flat and pale, margin crenulate. Spores smaller than in number 52. L. distans, Ach. L. U. 397.

54. L. hageni, Ach. Thallus cinerascent, verruculose or wanting; apothecia small or minute, crowded, plane or tumid; pale to fusco-rufous or sometimes pruinose; margin white, commonly crenate or entire; may be excluded. Th. Fr. Scand. 250. L. umbrina, (Massalongo) Nyl.

On rails near Lemont and on calcareous rocks. Some conditions are known as L. umbrina, (Mass.) Nyl. The observer cannot but see close relations in L. hageni to L. subfusca and the next following species.

55. L. **hageni,** Ach., var. **sambuci,** (Pers.) Nyl.. L. Sambuci, Nyl. Th. Fr.

Found rarely on elms, poplars and shrubs in Will County.

56. L. **varia,** (Ehrh.) Nyl. Thallus verruculose, greenish or yellowish; apothecia small, the disk yellow to flesh-color or rufescent, thin; margin entire or crenulate, often excluded. Spores oblong-ellipsoid. Nyl. Scand. 163.

On oaks near Elgin, Lemont and elsewhere. There are numerous varieties.

57 L. **varia,** (Ehrh.) Nyl., var. **symmicta,** Ach. Thallus thin, whitish; apothecia yellowish, disk swollen, excluding margin; biatoroid. Fr. L. E. Nyl. Tuck. Syn.

On various trees.

58. L. **calcarea,** Sommerf. Thallus white, contiguous; apothecia innate, emerging; disk grey-pruinose. Spores ovoid-ellipsoid. Nyl. Scand. 154.

On calcareous rocks at Joliet.

59. L. **calcarea,** Sommerf., var. **contorta,** Fr. Areoles discrete, pale lead-color. L. calcarea, f. Hoffmani. Nyl.

On calcareous rocks at Joliet. A very curious form.

60. L. **cervina,** (Pers.) Nyl. Thallus tartareous, areolate, squamulose; scales sub-peltate, from yellowish to chestnut; apothecia medium size, impressed, becoming superficial; disk reddish-brown, thalline margin obsolete. Nyl. Scand. 174. Tuck. 202.

On detached sandstones in Cook and Will Counties.

61. L. **privigna,** (Ach.) Nyl. Thallus wanting; apothecia varying from small to large; sessile, appressed; scattered or aggregated; disk dark red; margin elevated, rugged, contorted. Spores numerous, minute Lecidea, Ach. M. L. 49. Sarcogyne, Koerber, Syst. 266. Biatorella, Th. Fr. Scand. 407.

Found on calcareous pebbles near Elgin, on rocks near Joliet.

62. L. privigna, (Ach.) Nyl., var. pruinosa, (Auctt.) Apothecia small, appressed, sunken; disk gray-pruinose. Sarcogyne, Koerber. Lecanora, Nyl.

On sandstone boulders near Lemont This, and the two preceding forms, are so nearly related that one is puzzled to distinguish them without a familiar acquaintance with suites of specimens from different localities. The most perfect representations of the variety are from the Trenton rocks of LaSalle County, Illinois, and from Tennessee.

The variety clavus, Koerber, should be found in our limits also.

63. L. perproxima.* Nyl. Spec. nova. Resembles L. erysibe, Ach., nevertheless the spores are larger, .014-18 by .007 mm., and the hymenial gelatine with iodine is a beautiful blue, becoming deep blue. In appearance it resembles L. cæsio-cinerea, Nyl.

On calcareous rocks at Joliet and elsewhere.

64. L. erysibe, Ach. Thallus cinerous, thin, diffract; apothecia fusco-rufous, plane or convex.

On calcareous rocks in Will County; abundant.

Rinodina, Mass. Stizenb. Tuckerm. Thallus crustaceous, apothecia scutellæform, often zeorine, then lecideine. Spores ellipsoid, bilocular, brown.

65. R. sophodes, (Ach.) Nyl. Thallus gray or cinereo-fuscescent; apothecia small, appressed; disk flat, fuscous-black; margin entire. Nyl. Scand. 148. Th. Fr. Scand. 199. Tuck. Syn. 207.

On boulders near Lemont. I have not met with it elsewhere so far north.

66. R. bischoffi, (Hepp.) Koerber. Thallus ash-colored or fuscescent; thin, farinose; apothecia small, sessile, flat or convex; margin fuscescent or cinerascent. Spores broad, fruit finally lecideoid. Th. Fr. Scand. 204. Tuck. Syn. 209.

On calcareous rocks at Joliet and Lemont. A little known species. Occurs more abundantly further south and west.

*L. perproxima, Nyl. Spec. Nova. Proxima L. erysibe, Ach. Sporis nonnihil majoribus, long. 0,014-18, crass. 0.007 millim., et gelatina hymenialis. Iodo bene cœrulescente, cœrulescentia persistente. Facies fere Lecanora cæsio-cinerea, Nyl.

Pertusaria, D C. Thallus crustaceous, continuous, smooth or verrucose; apothecia globular, difform, closed; enclosed in thalline verrucæ, opening by pores (ostioles); explanate, lecanoroid. Spores generally large, ellipsoid.

67. **P. velata.** (Turn) Nyl. Thallus white, glaucescent, rugose, chinky, rimose, radiate near the circumference; apothecia small, adnate, pale yellowish, white powdery; the thalline margin disappearing in the fruit. Muhl. Br. L. 274. Tuck. Syn. 212.

On rocks and trees.

68. **P. multipuncta,** (Turner.) Nyl. Thallus ash colored, rugose, verrucose, zonate at the circumference; apothecia small, in verrucæ—2–4; lecanoroid, finally elevated; disk becoming black, soon excluding the thalline margin and often forming powdery heaps. P. faginea, Tuck. Syn. N. E. 64.

On oaks and hickories; not rare.

69. **P. communis,** D C. Thallus glaucescent, smooth, chinky or rugose-verrucose, may become zonate at the circumference; apothecia small, adnate, depressed, sub-globose, difform, closed, the numerous ostioles sunken and black. Spores generally in twos, sometimes solitary. Porina pertusa, (L.) Ach. Syn. L. 109, etc.

Common on oaks everywhere in our territory.

70. **P. leioplaca,** (Ach.) Schaer. Thallus whitish or more commonly pale-yellowish; apothecia medium size, globular and difform, often crowded together; depressed ostioles indistinct, often blackening. Nyl. Scand. 181. Tuck. Syn. 215.

On oaks near Elgin and elsewhere.

71. **P. pustulata,** (Ach.) Nyl. Thallus greenish or whitish; chinky, or verruculose; apothecia very small, hemispherical and difform, globular or confluent; ostioles black. Spores in twos. Porina, Ach. L. U. 309. Tuck. Syn. 215.

On trees; general in distribution here and elsewhere.

Conotrema, Tuckerm. Thallus crustaceous, uniform; apothecia urceolate, truncate-conoid. Spores cylindraceous, pluri-locular.

72. C. urceolatum, (Ach.) Tuckerm. Thallus smooth, becoming chinky and rugged, whitish; apothecia small, urceolate, from black to pruinose; prominent, elevated. Lecidea, Ach. L. U. 671. Gyrostomum, Fr. Tuck. Gen. L. 129. Conotrema, Tuck. Syn. 217.

This, the only species of the genus and has a wide distribution. Found on maples and poplars in Cook and Will Counties; also further west and south in Illinois. The genus Gyalecta should occur with this in our territory, affording at least the two species, G. lutea and G. trivialis, Willey. They are very small and may have escaped discovery here, though found in southern Illinois.

Urceolaria, (Ach.) Flotow. Thallus crustaceous, uniform; apothecia urceolate. Spores ovoid-ellipsoid, muriform, pluri-locular; fuscescent.

73. U. scruposa, (L.) Nyl. Thallus tartareous, rugose-plicate; glaucous, ash-colored or white; apothecia immersed, but emerging, urceolate, large, black; disk somewhat cinereous; margin denticulate, hidden by the thalline one, if present. Nyl. Scand. 176. Tuck. Syn. 222. Muhl. Cat. 1818.

Found on calcareous earth in Will County and on dead cedars along the banks of the Illinois; rare.

TRIBE II. LECIDEACEI.

FAMILY 7. CLADONIEI.

Cladonia, Hoffman. Thallus squamulose, rarely granulose or deficient; apothecia variously colored, but never black; soon inflated and cephaloid; podetia fistulous, funnel or tubulose in shape, often shrub-like. Spores small. Tulasne, Mem. sur. les Lich. Tuck. Gen. Lich. and Syn.

74. C. mitrula, Tuckerm. Thallus of small squamules, minute, green; podetia short, granulate, glaucescent; apothecia confluent, flesh-colored or brown. Tuck. in Fl. Cestrica. 444. Nyl. Syn. 203.

On earth and old logs in Cook and Will Counties. Generally distributed west and south.

75. C. **pyxidata,** (L.) Fr. Thallus squamulose; podetia cup-shaped, warty, turbinate, ash-colored; the cups cyathiform; often proliferous; apothecia brown. Nyl. Syn. 192. Tuck. Syn. 241.

Formerly abundant on earth along the lake shore in woods. Common elsewhere in our territory, on earth and rocks.

76. C. **pyxidata,** (L.) Fr., var. **Pocillum,** Ach. Has foliaceous thallus and reduced podetia.

Occurs rarely in our limits.

77. C. **fimbriata,** (L.) Fr. Thallus squamulose, but reduced; the podetia elongated, often white-powdery; cups with erect margins; apothecia brown. Fr. L. E. 222.

Found on rotten logs at Glencoe, and elsewhere on logs and earth.

78. C. **fimbriata,** (L.) Fr, var. **tubaeformis,** Fr. Podetia slender, elongated, tawny-brown, often with squamules; cups smaller, toothed or entire; proliferous, fimbriate; apothecia confluent. Tuck. Syn. 241.

Found throughout our territory. Synonomy numerous.

79. C. **gracilis,** (L.) Nyl. Thallus squamulose, but often wanting, ash-green; podetia slender to robust, corticate, polished, proliferous; apothecia fuscous. Nyl. Syn 196, C. ecmocyna, Ach.

On earth in Will County.

80. C. **gracilis,** (L.) Nyl., var. **verticillata,** Fr. Cups proliferous from the centre, dilated.

On earth in Will county.

81. C. **squamosa,** Hoffman. Thallus much divided; podetia much branched; apothecia cymose, fuscous. Fr. L. E. 231. Nyl. Tuck. Syn. 246.

On earth and rotten logs in Will County and the western part of Cook.

82. C. **delicata**, (Ehrh.) Fr. Thallus reduced, more often of crowded white granules; podetia short, slender; apothecia heaped, fuscous. Nyl. Syn. 210. Tuck. Syn. 6. C. parasitica, Schaer.

Found near Elgin on old stumps, near Lemont, and elsewhere. Very closely related to C. squamosa, Hoffm. *Vide*. Fr. L. E.

83. C. **furcata**, (Hudson) Fr. Thallus squamulose but small; podetia fruticulose, elongated, corticate; brownish-green, fertile summits corymbose, pervious; apothecia brown. Fr. L. E. 229. Tuck. Syn. 247.

On calcareous soil near Joliet and elsewhere.

84. C. **rangiferina**, (L.) Hoffm., var. **sylvatica**, L. Horizontal thallus wanting; the podetia two to four inches high; cinerascent, erect, branched and imbricate, terminal ones divaricated, corymbose. A more delicate form than the species. Fr. Tuck., etc.

Occurs on dead wood and sandstones in the Desplaines Valley, but is more common further west. The species is found from the arctic circle to the tropics in one form or another. Known as the "Reindeer moss."

85. C. **cristatella**, Tuck. Thallus squamulose, minute, cut and crenate; podetia fair size, often elongated, cylindrical, corticate; smooth or wrinkled, summits fastigiate; apothecia scarlet, or as var. b. Tuck. ochrocarpia, C. flœrkiana Tuck Syn. N. E. 55, etc.

Found occasionally in our territory on old decaying logs and stumps.

86. C. **macilenta**, (Ehrh.) Hoffm. Thallus squamulose, minute, crenate, lobate; podetia cylindrical, slender, granulose-pulverulent above; apothecia terminal, confluent, scarlet. Fr. L. E. 240. Tuck. Syn. N. E. 55.

On earth and logs in woods near Joliet; rare. This and No. 85 may be easily identified by the scarlet fruit.

Myriangium. Mont. and Berk. Thallus cellulose, orbiculate, plicate-striate at the circumference, nodulose; apothecia lecanoroid. Spores oblong-ovoid.

87. **M. duriaei,** (M. & B.) Tuckerm. Thallus crustaceous, adnate, becoming free, fuscous; apothecia elevated, blackish, disk with depressed, entire margin. Tuck. Gen. L. 140. M. curtisii, M. & B.

Collected several years ago on Corylus near River Forest; not observed elsewhere. Common south. Its position among the lichens is considered doubtful.

FAMILY 8. LECIDEEI.

Biatora, Fr. Thallus various or deficient; apothecia diverse in color, becoming soft and swollen when wet. Spores ellipsoid and simple, or assuming different forms, colorless, numerous.

88. **B. coarctata,** (Ach.) Th. Fr. Thallus cinereous, of minute squamules, rimose-areolate; apothecia small, fuscous or blackish, connivent or open, sometimes flat. Spores ovoid-ellipsoid. Lecidea, Nyl. Scand. 196. Tuck. Syn. Pt. 2. 15. Parmelia, Fr. L. E. 104.

On calcareous and arenaceous rocks in Will County; also found on detached sandstones in Cook County. A widely distributed and variable species.

89. **B. varians,** Ach. Thallus of minute granules compacted into a yellowish or greenish crust, which is granulate or broken; apothecia very small, yellowish, rufous or blackish; disk flat, margin thin. B. exigua, (Chaub.) Fr. L. E. 278.

On oaks and hickories near Elgin and Lemont.

90. **B. rubella,** (Ehrh.) Rabenh. Thallus yellowish or grayish-green, effuse, confluent; apothecia luteo-rufescent, or reddish-brown; scattered or congregate, becoming tumid and margin excluded, the latter often whitish. Spores pluri-locular. Lecidea, Schaer. Spicil. 168. Bacidia, Th. Fr. Scand. 344. Biatora, Tuck. Syn. Pt. 2. 14.

This widely diffused species occurs in our county on hickories and oaks. It is variable, and a number of varieties, fourteen or more, have been created species. Each has an extensive synonomy.

91. **B. fusco-rubella.** Hoffm. Thallus granulate, rugose, chinky, ash-colored; apothecia medium size, sessile, flat; disk often turgid, rust-colored, chestnut, or even black. Bacidia, Th. Fr. Scand. 346. Lecidea spadicea, Ach. Syn. L. 34. Tuck. Syn. Pt. 2. 43. (Var. b.)

In same localities as the preceding species.

92. **B. suffusa.** Fr. Thallus the same as in No. 91. Apothecia ample, reddish brown, suffused partially or wholly with white; disk rufescent, becoming darker, turgescent, excluding the margin, suffused with white. Tuck. Gen. Lich. 166. (Var. c.) Tuck. Syn. Pt. 2. 43.

On hickories in Hanover, Cook County, and near Lemont and Joliet.

93. **B. inundata.** Fr. Thallus scurfy, greenish, rimose-areolate; apothecia minute, sessile or adnate, flat or convex; tumid-brownish, black, often excluding the margin; hypothecium pale. Spores slender. Secoliga, Stizenb. Bacidia, Koerb. Biatora. Tuck. Syn. Pt. 2. 45.

In all our territory on detached rocks or stones along streams; the thallus is best shown on sandstones.

94. **B. cyphalea.** Tuckerm. Thallus thin granulose, cinerascent; apothecia small, dark reddish or rust-colored. Tuck. Syn. Pt. 2. 51, and Gen. L. 168.

Rare on elms near the Fox River; may be found elsewhere.

Lecidea. (Ach.) Fr. Tuckerm. Thallus various, crustaceous, squamulose or evanescent; apothecia patellæform, horny. Spores colorless. Fr. L. E. Tuck. Syn.

95. **L. enteroleuca.** Fr. Thallus granulose and cinerascent, often wanting; apothecia small to large, adnate, convex, often excluding margin, black. Spores ovoid-ellipsoid. Fr. L. E. 331. Tuck. Syn. N. E. 67. Nyl. Scand. 217.

This species has many forms and has been described under various names. Some of them occur on rocks and mosses, others on trees. It is found on maples in Will County. It is the only species of the genus within our limits so far as known. There are six described varieties in the United States.

Buellia. (De Not.) Tuckerm. Thallus mostly uniform; apothecia patellæform. Spores ellipsoid, brown or decolorate.

96. **B. parasema.** (Ach.) Th. Fr. Thallus cinerascent or darker, rugose, granulate, glaucescent; apothecia sessile, black; disk flat, often turgid; margin thin. Lecidea, Fr. Tuck. Syn. N. E. 67. L. disciformis, Nyl.

On oaks near Elgin and elsewhere on dead wood. Occurs everywhere in North America; a variable species.

97. **B. schaereri.** De Not. Thallus granulose, often wanting, cinerascent; apothecia very small, black, flat; disk turgescent and margin wanting. Lecidea nigritula, Nyl. Scand. 238.

Found on an old stump near Lemont, also on old rails; not common. Is also found in Grundy and LaSalle Counties.

TRIBE 3. GRAPHIDACEI.

FAMILY 9. OPEGRAPHEI.

Opegrapha. (Humb.) Ach. Nyl. Thallus hypophlæous, or, if exposed, thin; apothecia normally lirellæform.

98. **O. atra.** (Pers.) Nyl. Thallus thin or wanting; apothecia sessile, black, simple, flexuose; disk open, canaliculate, proper margin thick, elevated, wavy.

Throughout our territory on oaks, hickories, cherries, etc.

99. **O. varia.** (Pers.) Fr. Thallus white, pulverulent: apothecia prominent, elongate, oblong, elliptical, attenuate at the ends, brownish-black, dilated in the centre; margin inflexed.

On various trees in Cook and Will Counties.

Graphis. (Ach.) Nyl. This genus has been fully discussed by Nylander, who followed the thought of Acharius, and by Tuckerman, in his Genera Lichenum, 203; Syn Pt 2. 119. Thallus crustaceous, uniform; apothecia mostly lirellæform, and branching, but in some species rounded, difform; the proper exciple colored or black. Differentiated from Opegrapha by the spores.

100. **G. scripta.** (L.) Ach. Thallus thin, whitish, even or rugose, sub-tartareous; apothecia immersed or half immersed, slender, width uniform, simple or branched, obtuse at ends; proper margin narrow, wavy; thalloidal margin tumid. Spores colorless.

Common everywhere on oaks, hickories and other trees; apothecia variously branched. There are a number of varieties which may occur here.

101. **G. dendritica.** Ach. Thallus white or yellowish, thin, pulverulent; apothecia brownish-black, immersed, broad, flexuose-branched, forked; disk broad, often cæsio-pruinose; margin thin.

On oaks and various trees within our limits. These two species seem to be the only ones of this genus in northern Illinois. One other can be added for the southern portion of the State. When compared with the exuberance of forms in Florida, derived, however, from semi-tropical or tropical sources, this is a small number. The limitation of species is well illustrated by tracing this genus from south to north.

FAMILY 10. GLYPHIDEI.

Arthonia. (Ach.) Nyl. This genus, containing a great number of species mostly tropical, is one of the most perplexing. Dr. Nylander, more than twenty years ago, described about one hundred species. Henry Willey in his "Synopsis," published in 1890, admits three hundred and forty-eight species, and mentions a few more that he had not seen. About eighty of these are from the United States, four or five of which were discovered by the author. The genus should have been spelled Ardonia, according to its derivation from the Greek, but long usage has sanctioned the present spelling. The genera Chiodecton and Glyphis, which immediately precede

Arthonia, are not found in our territory, but inhabit Florida. We have several species of Arthonia, two so abundant as to be easily identified.

102. **A. lecideella,** Nyl. Thallus green, uneven, effuse; apothecia abundant, small, round, plain, pruinose. Spores oblong-ovoid. Nyl. En. 337. Tuck. Gen. 221. Willey, Syn. 16.

On hickories and Cratægus throughout our territory.

103. **A. spectabilis,** Fl. Thallus thin, white; apothecia black, difform, angulate, plain or convex, often bordered by the thallus. A. dispersa, Duf. A. polymorpha, of Muhl. Catal. 1818. Willey, Syn. 51.

On maples at Glencoe, Riverside and elsewhere. It is also found on other trees. Synonyms numerous.

104. **A. diffusa,** Nyl. Thallus white, effuse or wanting; apothecia round or difform, plane or convex, pruinose. A. willeyi. Tuck. in litt. Willey, Syn. 36.

On hickories and maples in Will County; not common.

105. **A. pyrrhuliza,** Nyl. Thallus white, thin; apothecia reddish, slender, much divided, ramose. Willey, Syn. 15.

On oaks in Will County: rare. Was once considered the A. medusæa of Tuckerman. May occur on Cratægus, in which case it is more likely to be noticed.

106. **A radiata,** (Pers.) Th. Fr. Thallus whitish, darkening, or obsolete; apothecia dark-brown, stellate, difform or ramulose, erumpent. Opegrapha, Pers. (1794). Arthonia, Th. Fr. Arctic. 240. A. astroidea, Ach. Syn. 6. Willey, Syn. 44.

Has many synonyms, and until lately was known as A. astroidea, Ach. Found on oaks near Elgin and elsewhere. The variety swartziana, Nyl. should also occur within our limits.

107. **A. taediosa,** Nyl. Thallus indeterminate; apothecia erumpent, linear, heaped, few branched and sometimes round.

On maples in the Desplaines valley; also found on oaks. The name is very applicable, its habit, as to form, may be called sportive.

NOTE--Tribe 4, including the genera Siphula, Sphærophorus, Acroscyphus, Acolium, Calicium and Coniocybe, have not been found in our territory. The two latter genera are possibilities.

SERIES II. ANGIOCARPI.

TRIBE V. VERRUCARIACEI.

FAMILY 11. ENDOCARPEI.

Endocarpon, (Hedw.) Fr. Thallus foliàceous, or crustaceous, peltate; apothecia imbedded, minute. Spores colorless. For exposition consult Tuck. Gen. Lich. 246.

108. **E. miniatum,** (L) Schaer. Thallus cinereous, large, peltate, lobate-crenate, umbilically affixed; underside smooth or rugose, fulvous; apothecia numerous and minute, immersed, brownish.

On calcareous rocks near Lemont and elsewhere. The species has a wide distribution; is found in Europe and Japan, being used in the latter country, as I am informed by Prof. Minakata, as an article of diet. The thallus is often one inch or more in diameter. Abundant in Illinois.

109. **E. miniatum,** (L.) Schaer., var. **complicatum,** Schaer. A polyphyllous form.

Found on limestone rocks at Lemont and elsewhere.

110. **E. miniatum,** (L.) Schaer., var. **muhlenbergii,** Ach. Occurs with the first named and is scarcely distinct.

111. **E. hepaticum.** Ach. Thallus fuscous, squamose, small, round or angular; apothecia numerous, blackish. Ach. L. U. 298. (1810). Nyl., etc.

On calcareous earth at Lemont and in Will County.

112. **E. pusillum,** Tuckerm. Thallus very small, greenish, thin; apothecia minute, imbedded.

Very abundant throughout our territory on various rocks and stones. The genus Endocarpon was founded upon this species. V. pallida, Nyl. Ach. L. U.

113. E. **rufescens,** Ach. Thallus rufescent, squamose, lobes rotundate, incised, complicate. Ach. L. U. 304. (1810).

On earth in Will County. Not easily distinguished from E. hepaticum, but is darker and thinner, and the spores are smaller.

FAMILY 12. VERRUCARIEI.

Sub-family Pyrenulei.

In the following genera we approach the limits marking the close relations of the lower lichens with the fungi. The absence or slight indications of a thallus have caused Lichenologists to doubt whether certain species of Verrucaria and Pyrenula, should be classed under these names, or as Sphærias. The effort has been made to eliminate the myco lichens, all corticolous, from the true ones. Fries expressed this idea,* and that a distinction be made between the saxicoline and corticoline groups, which, seeming a natural arrangement, I have followed. Tuckerman conceived the sub family as naturally divided into two great classes: "the one," to quote his own language, "(confined to inorganic substrates) of true lichens, with a well marked thallus, and the other (confined to organic substrates) of plants, the thallus of which is more or less obsolete, and the affinity close to Pyrenomycetous Fungi." But even with a fair array of evidence in support of this arrangement, Nylander dissents from this view.†

Sagedia, (Mass.) K'br. Tuckerman. Thallus crustaceous; apothecia innate-superficial. Koerber. Syst. 362. Nyl. Pyrenoc. 36. classed under Verrucaria. Tuck. Gen. Lich. 263.

114. S. **oxyspora,** Tuckerm. Thallus thin, effuse; apothecia black, ellipsoid, conoid; perithecium black. V. albissima, Nyl. Scaud.

Occurs on Betula papyracea along the lake shore near Glencoe. The few native birch will soon disappear and with them this species.

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*Syst. Orbis Viget. 264.

†Nyl. Pyrenoc.

Verrucaria, (Pers.) Tuckerm. Thallus crustaceous, sub-tartareous, mostly uniform; apothecia globular, black, immersed or prominent; perithecium black. The synonomy of this genus is numerous. Tuck. Gen. Lich. 263. Verrucaria is restricted here to the rock and earth lichens, species taken from Pyrenula and other genera, which, as Tuckerman remarks, shows a full and harmonious spore-character. In Europe a large number of forms have been included under Verrucaria, but Fries and Nylander have made a great reduction.

115. **V. prospersella,*** Nyl. Spec. nova. Thallus uninterruptedly white or scattered, becoming chinky with age reaction; apothecia pyrenoid, wholly black, small (breadth, .15 mm.), somewhat globose, rather prominent. Spores 8. colorless, oviform, 1 septate, .018-22 by .008-.011 mm. The paraphyses few or scarcely any. Hymenia gelatinous-reaction. Occurs on siliceous rocks near Chicago. (Calkins). This species seems to approach V. inconspicuam, Lahm, from which it differs by its larger spores. Likewise near to V. saxicola, Mass. The calcicolous species, V. ruderella, Nyl. also occurs in the same locality. Nyl Chall. p. 217.

First found at Riverside. Described and published by Dr Nylander in his "Obs." Lichens Japoniæ, Paris, 1890 Abundant so far as known.

116. **V. pyrenophora,** (Ach.) Nyl. Thallus tartareous, chinky, ash-colored or continuous and rugulose; apothecia prominent, black, large conoidal, sessile; perithecium dimidiate. Spores 8, colorless. Ach. L. U. 285. (1810).

On rocks at Riverside, Lemont and throught our territory.

117. **V. nigrescens,** Pers. Thallus nearly black, crustaceous, uneven, crumbling, and often raised around the apothecia; apothecia black; perithecium dimidiate. Spores 8, colorless.

On limestone along streams in various localities.

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*V. prospersella, Nyl, Spec. nova, Thallus albidus continus, vel passim obsolete rimulosus; apothecia pyrenio integre nigro, minuta (latit. 0,15 millim.), subglobulose prominula: sporae 8 nae incolores oviformes 1-septatae, long. 0,018-22, crass. 0,008-011 millim; paraphyses graciles parcæ vel vix ullæ. Gel. hym. I. Super saxum siliceum haud procul a Chicago (Calkins). Accedere videtur ad V. inconspicuam, Lahm. a qua mox differt sporis majoribus. C. fr. etiam V. saxicola, Mass.--Calcicola ibidem (idem) V. ruderella, Nyl. Chall. p. 217.

118, **V. fuscella,** Fr. Thallus crustaceous, dark brown, areolate-diffract. black-limitate, smooth: apothecia minute, immersed in the areolæ. Spores 8, colorless. Ach. L. U. 289.

Found on detached calcareous-rocks near Joliet; not common as far as observed. A well defined and interesting species.

119. **V. muralis,** Ach. Thallus whitish, tartareous, mealy or wanting; apothecia black, semi-immersed, hemispherical; perithecium dimidiate.

Found on limestone near Joliet and in Cook County, and sometimes on old mortar.

120. **V. viridula,** Ach. Thallus greenish olive, areolate-diffract, areolæ polygonal, smooth or rugose, effuse; apothecia black, numerous, semi immersed. Spores 8, colorless.

On detached calcareous rocks, north bluff at Lemont

Pyrenula, (Ach., N. & H.) Tuckerm. Thallus hypophlœoid, subcortical, rarely ektophlœoid, superficial; apothecia denudate, perithecium black, ellipsoid oblong, etc.

121. **P. gemmata,** (Ach) Naeg. Thallus whitish, thin; apothecia black, medium to large, prominent, convex; perithecium black, dimidiate. Spores colorless. Ach. Meth. Lich. 120. (1803). Acrocordia, K'br.

On oaks and hickories at River Forest and in all our territory This species is closely related to Sphæria mastoidea, Fr.

122. **P. punctiformis,** (Ach.) Naeg. Thallus thin, effuse, brown; apothecia black, shining, minute, sessile-innate, conoid; perithecium dimidiate. V. epidermidis, Nyl. Offers a near approach to Fungi according to Fries, Wallroth, Tuckerman.

On Quercus alba near Elgin and elsewhere.

123. **P. thelaena,** (Ach.) Tuckerm. Verrucaria, Ach.
On birch trees at Glencoe; on maples and hickories near Riverside.

124 **P. nitida,** Ach. Thallus pale yellowish or olive, waxy, smooth; apothecia black, in size medium to large, though sometimes small, invested by the thallus, globose; perithecium black. Spores fuscous. Sphæria, Weigel, Obs. 45. (1772). Verrucaria, Ach. L. U 279. Nyl., etc.

On oaks and maples throughout our territory, perhaps not abundant, yet it may be in some places. The very pale thallus will identify its location more easily. American specimens vary greatly in size.

125. **P. glabrata,** Ach. Thallus whitish, thin; apothecia variable in size, black, hemispherical, conoid; perithecium black. Spores fuscous. Ach. Syn. 791. Nyl. Pyren. 47.

On oaks near Elgin and Joliet; apparently not common. Some Florida specimens are of extraordinary size, making their proper position questionable.

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INDEX TO GENERA.

Arthonia, - - - - - - 37
Biatora, - - - - - - 34
Buellia, - - - - - - 36
Cetraria, - - - - - - 17
Cladonia, - - - - - 31
Collema, - - - - - 23
Conotrema, - - - - - 30
Endocarpon, - - - - - 39
Graphis, - - - - - - - 37
Heppia, - - - - - - 23
Lecanora, - - - - - - 26
Lecidea, - - - - - - 35
Leptogium, - - - - - - 24
Myriangium, - - - - - 34
Opegrapha, - - - - - - 36
Pannaria, - - - - - 23
Parmelia, - - - - - - 18
Peltigera, - - - - - 22
Pertusaria, - - - - - 30
Physcia, - - - - - - 21
Placodium, - - - - - - 25
Pyrenula, - - - - - - 42
Ramalina, - - - - - - 17
Rinodina, - - - - - - 29
Sagedia, - - - - - - 40
Theloschistes, - - - - - 18
Urceolaria, - - - - - - 31
Verrucaria, - - - - - - 41

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